

Notice of Allowability

Application No.

10/671,922

Examiner

Mohsen Ahmadi

Applicant(s)

DERDERIAN ET AL.

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to phone interview 08/09/2007.
2. ☒ The allowed claim(s) is/are 35-37, 39, 41 and 43-45.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 06/29/2007
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 08/09/2007
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


MICHAEL LEBENTRITT
SUPERVISORY PATENT EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney Jennifer J. Taylor on 08/09/2007.

In the claims, Claims 38, 40 and 42 are canceled.

Replace claim 35, with the following:

Claim 35 (Currently amended): An atomic layer deposition method comprising utilization of an electric field gradient within an atomic layer deposition reaction chamber to align non-ionized and electrically neutral molecules during the atomic layer deposition as at least portions of the non-ionized and electrically neutral molecules are incorporated into a material formed over a semiconductor substrate;

wherein the molecules are first molecules;

the atomic layer deposition process comprises provision of second molecules into the atomic layer deposition reaction chamber at a substantially non-overlapping time relative to the first molecules and incorporation of at least portions of the second molecules into the material formed over the semiconductor substrate; and

the electric field gradient is removed from within the atomic layer deposition reaction chamber prior to incorporating at least portions of the second molecules into the material.

Replace claim 37, with the following:

Claim 37 (Currently amended): An atomic layer deposition method comprising utilization of a magnetic field gradient within an atomic layer deposition reaction chamber to align non-ionized and electrically neutral molecules during the atomic layer deposition as at least portions of the non-ionized and electrically neutral molecules are incorporated into a material formed over a semiconductor substrate.

Replace claim 43, with the following:

Claim 43 (Currently amended): The method of claim 35 wherein:

the electric field gradient is in a first configuration during the incorporation of at least portions of the first molecules into the material and is in a second configuration, different from the first configuration, during the incorporation of at least portions of the second molecules into the material.

In the claims, Claim 39, line 1, change "claim 38" to --claim 35--

In the claims, Claim 41, line 1, change "claim 40" to --claim 35--

Allowable Subject Matter

Claims 35-37, 39, 41 and 43-45 are allowed.

The following is an examiner's statement of reasons for allowance: The closest prior art known to the Examiner is listed on the PTO 892 forms of record. With respect to claims 35, 37 and 44, the cited prior art does not anticipate or make obvious, *inter*

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alia, at least portions of the non-ionized and electrically neutral molecules which are incorporated into a material formed over a semiconductor substrate during the atomic layer deposition, wherein the molecules are first molecules, the atomic layer deposition process comprises provision of second molecules into the atomic layer deposition reaction chamber at a substantially non-overlapping time relative to the first molecules and incorporation of at least portions of the second molecules into the material formed over the semiconductor substrate and the electric field gradient is removed from within the atomic layer deposition reaction chamber prior to incorporating at least portions of the second molecules into the material. **With respect to claim 37**, at least portions of the non-ionized and electrically neutral molecules are incorporated into a material formed over a semiconductor substrate during the atomic layer deposition. **With respect to claim 44**, after the incorporation of at least portions of the first molecules into the material, the electric field gradient is changed to a second configuration in which the electric field increases along a second vector different from the first vector, and the electric field gradient remains in the second configuration during the incorporation of at least portions of the second molecules into the material and at least portions of the non-ionized and electrically neutral molecules are incorporated into a material

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohsen Ahmadi whose telephone number is 1-571-272-5062. The examiner can normally be reached on Mon-Fri 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 1-571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MA
08/10/2007

Mohsen Ahmadi

Michael Lebentritt
MICHAEL LEBENTRITT
SUPERVISORY PATENT EXAMINER